

ARC 5235

RFID Automated Transactions

The purpose of this project is to automate simple shop floor transactions through the reading of RFID labels.

This project requires assistance from Brady Stevens to set up, RFID label printing hardware, RFID reading hardware, and the third party software ClearStream for managing the RFID hardware. The files and tables can be installed from ARC, but there are additional scripts that can be optionally set up as well. ClearStream will need to be set up to write the proper data to the custom tables.

The current supported transactions are J52 (WIP to FG), J55 (Issue Material), L01 (Labor Upload), P10 (PO Receipts), O90 (Bin to Bin), and S99 (Load Validation).

Maintenance:

The options for this project can be maintained with the menu item Shop Floor Control > Administration > RFID Maintenance [5235].

The RFID Settings window is divided into two main sections. The left section, titled "Reader and Antenna List", contains a search bar and a table. The table has two columns: "Antenna Name" and "Parent Reader". The right section, titled "Options for Antenna", contains a "Parent Reader" dropdown, a "Last Read Time" field, and several transaction options.

Antenna Name	Parent Reader
Antenna: 1	Cart
Zone1	Cart
Antenna: 4	Lab
Debarker	Lab
Labor	Lab
Metal Detector	Lab
Receipt	Lab
Saw	Lab
WIP to FG	Lab

Options for Antenna

Parent Reader: Save

Last Read Time:

☐ Enable for J55 Transaction

J55 - Issue To WIP Transaction Options

Work Center: ☐ Print Issue Labels? Select Printer:

☐ FailureNotification Recipient Email ID: Sender Email ID:

☐ Enable for J52 Transaction

J52 - WIP to FG Transaction Options

Default WIP to FG Bin: ☐ Print WIP to FG Labels? Select Printer:

☐ FailureNotification Recipient Email ID: Sender Email ID:

☐ Enable for O90 Transaction

O90 - Bin to Bin Transaction Options

To Bin: ☐ Print Bin to Bin Labels? Select Printer:

☐ FailureNotification Recipient Email ID: Sender Email ID:

☐ Enable for L01 Transaction

L01 - Labor Upload Transaction Options

Work Center: Employee: ☐ Write Outside PO Request for Next Outside Sequence Close: Always Close:

☐ FailureNotification Recipient Email ID: Sender Email ID:

☐ Enable for P10 Transaction

P10 - PO Receipts Transaction Options

☐ Receive To Inspection ☐ Receive To Job ☐ Use Default

☐ FailureNotification Recipient Email ID: Sender Email ID:

The grid on the left will load in the antenna/reader list from the GCG_5235_RFID_HDWR table. Double clicking on an antenna/reader combination will bring up the last read time for it as well as the options for it. Select the transactions you want to enable it for. Most transactions have the option of printing a label, selecting a label printer, and turning on failure email notifications with a recipient and sender email address.

For the J55 and O90 transactions, the RFID data is expected to be in the format T[Lot]Q:[Quantity]. For example, T00001:Q10 where the lot is 00001 and the quantity is 10. Unique lot numbers are required for these transactions.

For the J52, L01, and O90 transactions, the RFID data is expected to be in the format J[JOB]:S[SUFFIX]:Q[Quantity]. For example, J000071:S000:Q35 where 000071 is the job and 000 is the suffix and 35 is the quantity. Unique lot numbers are not required for these transactions.

For the S99 transactions, the RFID data is expected to be in the format [TYPE]:[KEY]:[QUANTITY]. TYPE should be either blank for lot verification, C for Carton validation, or P for Pallet validation. The key should be the lot, pallet, or carton in question, depending on the type.

J55 – Issue Material:

For this transaction, select the work center to issue the material to. There can only be one workorder on the work center at a time. The program will look up the work order currently on the work center and issue the lot number to that.

J52 – WIP to FG:

For this transaction, select a default bin to put the finished good part in. If no bin is selected, the part will be put in standard inventory. The program will read the job, suffix, and quantity from the tag, and run the wip to fg transaction on it. It will honor auto lot numbering options.

O90 – Bin to Bin:

For this transaction, select the bin to transfer to. The program will read the lot and quantity from the tag, and move it from whatever bin it's currently in to the selected bin.

L01 – Labor Upload:

For this transaction, select a work center and an employee. The program will read the job, suffix, and quantity, and claim pieces against the job on that work center with a time of 0.1 hours. This works just like claiming pieces in the GUI, and will not be processed until the next time online update runs. This will trigger any backflushing or auto wip set up just like claiming pieces on the GUI. The sequence will be closed if necessary depending on the close option selected. If the Write Outside PO request checkbox is checked, an outside PO request will be written for the next outside sequence if there is one.

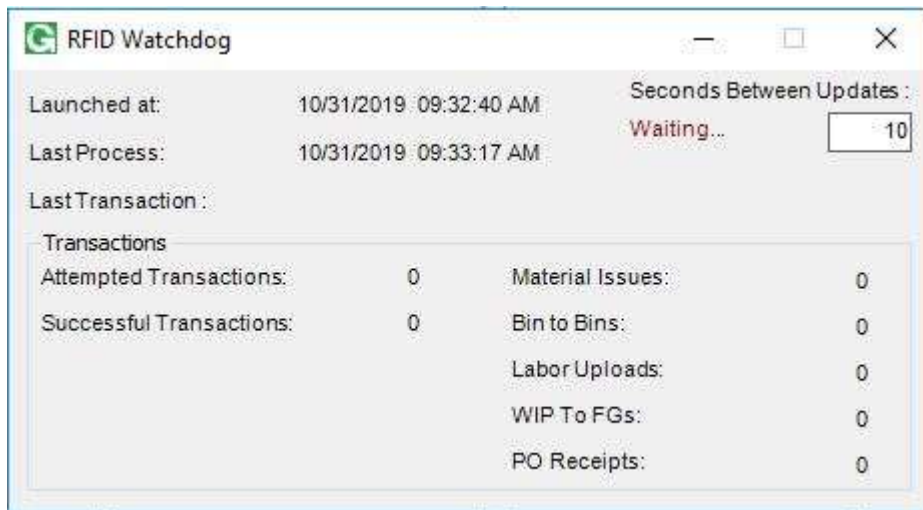
P10 – PO Receipts:

For this transaction, the program will read the job, suffix, and quantity from the tag, and look up the PO line for that job. It will receive pieces to it based on the inspection/job selection.

S99 – Load Validation:

For this transaction, set the URL for the Clearstream API, as well as the reader device and the port mapping. A load will need to be created using the **Shipping & Receiving > Transactions > Load Planning** menu. A load can then be started using the load management custom GS mobile transaction. This can be installed from the included GCG_5235_LoadManagement.g2u-MobExt.zip file using the 5448 GS Mobile Custom Transaction Import/Export Tool. When a tag is read, the program will check the type, key, and quantity from the RFID data. It will verify that this item is on the currently active load, and if this item is valid to load next. If the item is valid, the lightstack will flash green. If the item is valid, but loaded in the wrong order, the lightstack will flash red and yellow. If the item is not found on the load, or some other issue occurs, the lightstack will flash red. Results will also be shown on the Dock Dashboard.

Watchdog:



The RFID watchdog will launch from online update if not currently running. It will run until midnight each day, at which point it will close itself and reopen the next time online update processes. The interval between updates can be set here. A log file is written at Global\Custom\5235\Log\RFID_Transactions_Log.txt that will log any errors.

RFID Dashboard:


RFID Dashboard									
Reader Filter:		Antenna Filter:		Transaction Filter:		<input type="checkbox"/> Tags read in the last <input type="text" value="5"/> Minutes		<input type="checkbox"/> Auto Refresh <input type="text" value="10"/> Seconds	
Tag	Time Last Read	Time Processed	Reader	Antenna	Transaction	RFID Value	Processed	Failed	Fail Reason
68	10/30/2019 2:33:00 PM	10/30/2019 2:33:22 PM	Lab	WIP to FG	J52	3000061:S0...	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
67	10/30/2019 2:33:00 PM	10/30/2019 2:33:22 PM	Lab	WIP to FG	J52	3000062:S0...	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
66	10/30/2019 2:32:11 PM	10/30/2019 2:32:38 PM	Lab	WIP to FG	J52	3000060:S0...	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
65	10/30/2019 2:31:56 PM	10/30/2019 2:32:15 PM	Lab	Receipt	P10	3000062:S0...	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
64	10/30/2019 2:31:56 PM	10/30/2019 2:32:15 PM	Lab	Receipt	P10	3000061:S0...	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
63	10/30/2019 2:31:56 PM	10/30/2019 2:32:15 PM	Lab	Receipt	P10	3000060:S0...	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
62	10/30/2019 2:30:16 PM	10/30/2019 2:30:32 PM	Lab	Labor	L01	3000062:S0...	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
61	10/30/2019 2:30:14 PM	10/30/2019 2:30:32 PM	Lab	Labor	L01	3000060:S0...	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
60	10/30/2019 2:30:14 PM	10/30/2019 2:30:32 PM	Lab	Labor	L01	3000061:S0...	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
59	10/30/2019 2:10:13 PM	10/30/2019 2:11:05 PM	Lab	WIP to FG	J52	3000058:S0...	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
58	10/30/2019 2:10:12 PM	10/30/2019 2:11:05 PM	Lab	WIP to FG	J52	3000083:S0...	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
57	10/30/2019 2:10:12 PM	10/30/2019 2:11:05 PM	Lab	WIP to FG	J52	3000082:S0...	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
56	10/30/2019 2:10:12 PM	10/30/2019 2:11:05 PM	Lab	WIP to FG	J52	3000057:S0...	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
55	10/30/2019 2:10:12 PM	10/30/2019 2:11:05 PM	Lab	WIP to FG	J52	3000054:S0...	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
54	10/30/2019 2:10:12 PM	10/30/2019 2:11:05 PM	Lab	WIP to FG	J52	3000056:S0...	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
53	10/30/2019 2:10:12 PM	10/30/2019 2:11:05 PM	Lab	WIP to FG	J52	3000055:S0...	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
52	10/30/2019 2:10:12 PM	10/30/2019 2:11:05 PM	Lab	WIP to FG	J52	3000085:S0...	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
51	10/30/2019 2:10:10 PM	10/30/2019 2:11:05 PM	Lab	WIP to FG	J52	3000059:S0...	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
50	10/30/2019 2:10:10 PM	10/30/2019 2:11:05 PM	Lab	WIP to FG	J52	3000084:S0...	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
49	10/30/2019 2:09:17 PM	10/30/2019 2:09:43 PM	Lab	Receipt	P10	3000082:S0...	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
48	10/30/2019 2:09:15 PM	10/30/2019 2:09:43 PM	Lab	Receipt	P10	3000057:S0...	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
47	10/30/2019 2:09:15 PM	10/30/2019 2:09:43 PM	Lab	Receipt	P10	3000055:S0...	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
46	10/30/2019 2:09:15 PM	10/30/2019 2:09:43 PM	Lab	Receipt	P10	3000083:S0...	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
45	10/30/2019 2:09:15 PM	10/30/2019 2:09:43 PM	Lab	Receipt	P10	3000058:S0...	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
44	10/30/2019 2:09:15 PM	10/30/2019 2:09:43 PM	Lab	Receipt	P10	3000059:S0...	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
43	10/30/2019 2:09:15 PM	10/30/2019 2:09:43 PM	Lab	Receipt	P10	3000084:S0...	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
42	10/30/2019 2:09:15 PM	10/30/2019 2:09:43 PM	Lab	Receipt	P10	3000056:S0...	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
41	10/30/2019 2:09:14 PM	10/30/2019 2:09:19 PM	Lab	Receipt	P10	3000054:S0...	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Tags: 69									

The RFID dashboard is available at Shop Floor Control > View > RFID Dashboard [5235]. This will load in all reads and data about them. You can filter it by reader, antenna, transaction, and tags read in the last x minutes. When changing transaction filters, the program will ask if you'd like to load the default column layout for that transaction, which will remove any columns not related to that transaction. You can refresh it with the refresh button, or set it to auto refresh ever x seconds. If the transaction fails, the fail checkbox will be checked and a reason should be written.

Open WO Dashboard:

The project also includes a modified version of Advanced Planning System > View > Open Work Orders, Advanced Planning System > View > RFID Open WO Dashboard [5235]. This dashboard includes a column for if an RFID label has been printed or not. Click the checkbox when in edit mode to print an RFID label for that work order.

Open Work Orders



☒ View ☐ Edit ☐ Issue ☐ WIP to FG

Label Printer: RFID Quantity: 1 Late

Open Late Indirect

Drag a column header here to group by that column

	Printed	RFID Label	Released	On Hold	Work Order	Suf	Priority	Customer Name	SP	Customer PO	Part
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	500003	000	000	DIAMOND DAVE'S LTD.	DO		210900
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	500004	000	000	DIAMOND DAVE'S LTD.	DO		210900
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	500005	000	000	DIAMOND DAVE'S LTD.	DO		210900
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	500007	000	000	DIAMOND DAVE'S LTD.	DO		210900
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ZIND09	QT 1	000				INDIRECT
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	500008	000	000	DIAMOND DAVE'S LTD.	DO		210900
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	000155	001	000				0025
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	500003	002	000	DIAMOND DAVE'S LTD.	DO		210900-2
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	500003	003	000	DIAMOND DAVE'S LTD.	DO		210900-3
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	500003	004	000	DIAMOND DAVE'S LTD.	DO		210900-4
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	500003	005	000	DIAMOND DAVE'S LTD.	DO		210900-5
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	500003	006	000	DIAMOND DAVE'S LTD.	DO		210900-6
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	500003	007	000	DIAMOND DAVE'S LTD.	DO		210900-8
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	500003	008	000	DIAMOND DAVE'S LTD.	DO		210900-5
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	500003	009	000	DIAMOND DAVE'S LTD.	DO		210900-7
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	500003	001	000	DIAMOND DAVE'S LTD.	DO		210900-1
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	500004	007	000	DIAMOND DAVE'S LTD.	DO		210900-8
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	500004	002	000	DIAMOND DAVE'S LTD.	DO		210900-2
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	500004	003	000	DIAMOND DAVE'S LTD.	DO		210900-3
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	500004	004	000	DIAMOND DAVE'S LTD.	DO		210900-4

Dock Dashboard:

For S99 transactions, there is a dashboard which can be used on the shop floor to see the results and status of the current load. The dashboard is located at **Shipping & Receiving > View > RFID Dock Dashboard**. On the dashboard, a dock can be selected. The data for the current load on this dock will load. Validated lines will be highlighted green.

Load Validation Dashboard [5235] (PLA)

Global Shop SOLUTIONS

Dock: R3

Last Refresh: 2/25/2022 1:39:20 PM

☐ Auto Refresh

Auto Refresh Interval: 30

Last Read Time

Last Read Lot/Pallet/Carton

Last Read Result

Load	Load Seq.	Packing Nu...	Order	Order Line	Part	Loc	Qty. Ordered	Qty. Staged	Quantity	Lot
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Other Features:

- For Winesburg chair, there is also a bin status dashboard to watch the O90 and J55 transactions. This menu item will need to be added manually. The script is GCG_5235_BinStatus.g2u.

Part	Location	Lot	Bin	Heat	Quantity	Length	Diameter	Date	Time	Print Label	Issue Material
CREWMEMBER		009705	DECK		1.00			2/22/2019	5:04:00 PM	Print	Issue
CREWMEMBER		009706	DECK		1.00			2/22/2019	5:14:08 PM	Print	Issue
CREWMEMBER		009704	DECK		1.00			2/22/2019	5:14:41 PM	Print	Issue
CREWMEMBER		009702	DECK		5.00			2/22/2019	5:14:46 PM	Print	Issue

- To have failure notifications run, attach the GCG_5235_Notifications.g2u script to the 38130 post online update hook.
- For King Machine, there is a script to close sequences that have been backflushed to using the custom option to backflush to flagged work centers when pieces are claimed on a certain work center. This script will close any sequences with detail records on one of the flagged work centers. Activate this by attaching the GCG_5235_CloseBackflushedSequences.g2u script to the 38130 post online update hook.
- For King Machine, there is also a special version of the RFID Work Order Label, GCG_5235_RFIDWorkOrderLabel_King.lab, which can be manually installed.